

June 25, 1992

Docket No. 50-302

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Mr. Percy M. Beard, Jr.
Senior Vice President,
Nuclear Operations
Florida Power Corporation
ATTN: Manager, Nuclear
Operations Licensing
P. O. Box 219-NA-2I
Crystal River, Florida 32629

Dear Mr. Beard:

SUBJECT: CRYSTAL RIVER UNIT 3 - ISSUANCE OF AMENDMENT RE: FUEL RODS
(TAC NO. M82888)

The Commission has issued the enclosed Amendment No. 143 to Facility Operating License No. DPR-72 for the Crystal River Unit No. 3 Nuclear Generating Plant (CR-3). This amendment consists of changes to the Technical Specifications (TS) in response to your application dated February 13, 1992. Additional information was provided in your letters dated May 6 and June 4, 1992.

This amendment revises the fuel assembly description in TS 5.3.1 to permit the use of stainless steel rods to replace defective fuel rods. As discussed with your staff, this change restricts the use of reconstituted fuel assemblies to a specific arrangement for Cycle 9 operation only.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,
(Original Signed By)

Harley Silver, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

- Enclosures:
1. Amendment No. 143 to DPR-72
2. Safety Evaluation

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See next page

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Mr. Percy M. Beard
Florida Power Corporation

Crystal River Unit No.3
Generating Plant

cc:

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DATED: June 25, 1992

AMENDMENT NO. 143 TO FACILITY OPERATING LICENSE NO. DPR-72-CRYSTAL RIVER UNIT 3

Docket File

NRC & Local PDRs

PDII-2 Reading

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G. Lainas, 14/H/3

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ACRS (10)

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

FLORIDA POWER CORPORATION
CITY OF ALACHUA
CITY OF BUSHNELL
CITY OF GAINESVILLE
CITY OF KISSIMMEE
CITY OF LEESBURG
CITY OF NEW SMYRNA BEACH AND UTILITIES COMMISSION, CITY OF NEW SMYRNA BEACH
CITY OF OCALA
ORLANDO UTILITIES COMMISSION AND CITY OF ORLANDO
SEMINOLE ELECTRIC COOPERATIVE, INC.
CITY OF TALLAHASSEE

DOCKET NO. 50-302

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 143
License No. DPR-72

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Florida Power Corporation, et al. (the licensees) dated February 13, 1992, as supplemented May 6 and June 4, 1992, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

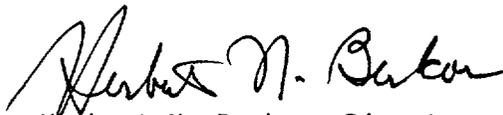
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-72 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No.143, are hereby incorporated in the license. Florida Power Corporation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 25, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 143

FACILITY OPERATING LICENSE NO. DPR-72

DOCKET NO. 50-302

Replace the following page of the Appendix "A" Technical Specifications with the attached page. The revised page is identified by amendment number and contains vertical lines indicating the area of change.

Remove

5-4

Insert

5-4

DESIGN FEATURES

DESIGN PRESSURE AND TEMPERATURE

- 5.2.2 The Reactor Containment building is designed and shall be maintained for a maximum internal pressure of 55 psig and a temperature of 281°F.

5.3 REACTOR CORE

FUEL ASSEMBLIES

- 5.3.1 The reactor shall contain 177 fuel assemblies. Each assembly shall consist of a matrix of Zircaloy-4 clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide (UO₂) as fuel material, with a maximum enrichment of 4.2 weight percent U-235. Limited substitutions of stainless steel filler rods for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC Staff approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases.* Each fuel rod shall have a nominal active fuel length of 144 inches and shall contain a maximum total weight of 2253 grams uranium.

CONTROL RODS

- 5.3.2 The reactor core shall contain 60 safety and regulating (including extended life control rods) and 8 axial power shaping (APSR) control rods. Except for the extended life control rods, the safety and regulating control rods shall contain a nominal 134 inches of absorber material. The extended life control rods shall contain a nominal 139 inches of absorber material. The nominal values of absorber material shall be 80 percent silver, 15 percent indium, and 5 percent cadmium. Except for the extended life control rods, all control rods shall be clad with stainless steel tubing. The extended life control rods shall be clad with Inconel. The APSRs shall contain a nominal 63 inches of absorber material at their lower ends. The absorber material for the APSRs shall be 100% Inconel.

*For Cycle 9 operation only, up to five recaged fuel assemblies, one that has been reconstituted with a single replacement stainless steel filler rod and four that have been reconstituted with two replacement stainless steel filler rods, arranged such that each stainless steel rod is fully surrounded by fuel rods, may be used as approved by the NRC safety evaluation for Amendment No. 143.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 143 TO FACILITY OPERATING LICENSE NO. DPR-72

FLORIDA POWER CORPORATION, ET. AL.

CRYSTAL RIVER UNIT NO. 3 NUCLEAR GENERATING PLANT

DOCKET NO. 50-302

1.0 INTRODUCTION

By letter dated February 13 1992, Florida Power Corporation (FPC or the licensee) requested an amendment to the Technical Specifications (TS) appended to Facility Operating License No. DPR-72 for the Crystal River Unit No. 3 Nuclear Generating Plant (CR-3). The proposed amendment would revise the description of fuel assemblies in TS 5.3.1 to permit the use of stainless steel rods to replace defective fuel rods. A footnote, added by the NRC staff after discussions with the licensee, restricts the use of reconstituted fuel assemblies to a specific arrangement for Cycle 9 operation only. Licensee letters dated May 6, 1992 and June 4, 1992 provided additional information which did not change the initial no significant hazards consideration determination.

The change involves the use of nine stainless steel dummy rods replacing nine fuel rods in five fuel assemblies in the CR-3 Cycle 9 core. Some fuel assemblies were reconstituted with two stainless steel rods, however, each stainless steel rod was surrounded by fuel-bearing rods, i.e., there were no stainless steel rods sharing a common coolant subchannel. In order to justify the use of stainless steel dummy rods in the core, the licensee performed cycle-specific reload analyses. The staff's evaluation follows.

2.0 EVALUATION

Dummy rods (Zircaloy-4 or stainless steel rods) were originally used in fuel assemblies to replace those fuel rods damaged by the baffle jetting problem in Westinghouse reactors. The concept was extended further to replace failed rods during reconstitution of fuel assemblies in other locations. However, in order to satisfy generic fuel design criteria as described in the Standard Review Plan, the dummy rods require mechanical, nuclear, and thermal-hydraulic analyses to demonstrate that inclusion of the dummy rods in fuel assemblies with the specific configurations and core locations chosen for a specific fuel cycle is acceptable with respect to the overall fuel performance and safety significant conclusions.

2.1 Mechanical Evaluation

The licensee stated that, based on a Babcock & Wilcox (B&W) structural evaluation, the stainless steel filler rods would not adversely affect the performance of a fuel assembly during a combined loss-of-coolant accident (LOCA) and safe shutdown earthquake (SSE). Since the total number of filler rods is limited to nine stainless steel rods in five assemblies, the staff concludes that there is reasonable assurance that the reconstituted assemblies will have no adverse effects on the CR-3 Cycle 9 core.

2.2 Nuclear Evaluation

The licensee provided a core map showing beginning-of-cycle (BOC-9) power distributions for Cycle 9 which showed that the reconstituted assemblies at the proposed core locations have substantial margin to the limiting peak power. Thus, the staff considers the nuclear design acceptable for Cycle 9.

2.3 Thermal-Hydraulic Evaluation

The licensee analyzed the reconstituted assemblies' departure from nucleate boiling ratio (DNBR) margin assuming a 10% DNBR penalty on the fuel rods adjacent to the stainless steel rod. The results showed that the most limiting reconstituted assemblies met the DNBR requirement. Based on the DNBR conservative assumption, the staff considers the thermal hydraulic analysis acceptable.

3.0 TS CHANGES

Section 5.3.1, Reactor Core

In Section 5.3.1, Reactor Core, Fuel Assemblies, the revised TS should indicate the use of nine dummy rods in five fuel assemblies based on the analyses approved by this Safety Evaluation for CR-3 Cycle 9 operation only. The proposed TS limits the use of dummy rods to those fuel designs that have been analyzed with staff-approved methods. Since this approval is limited to Cycle 9, the licensee has agreed to the following footnote to the TS:

"*For Cycle 9 operation only, up to five recaged fuel assemblies, one that has been reconstituted with a single replacement stainless steel filler rod and four that have been reconstituted with two replacement stainless steel filler rods, arranged such that each stainless steel rod is fully surrounded by fuel rods, may be used as approved by the NRC safety evaluation for Amendment No. 143."

The staff finds the modified TS change acceptable.

4.0 SUMMARY

The staff has reviewed the licensee's submittal, including the results of the safety analyses, to assure that the fuel assembly design changes will not result in failure to meet the pertinent design safety criteria. The staff concludes that the proposed TS revisions, as modified, are acceptable and that

the cycle-specific evaluation is acceptable for CR-3 Cycle 9 when the use of the dummy rods is limited as described in TS 5.3.1, as modified.

The application of these methods to cores with more extensive use of dummy rods will require further justification, such as that contained in the B&W Topical Report BAW-2149, "Evaluation of Replacement Rods in BWFC Fuel Assemblies," currently under separate review by the NRC. In addition, the DNB evaluation methods described herein are not approved for generic applications.

3.0 STATE CONSULTATION

Based upon the written notice of the proposed amendment, the Florida State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding (57 FR 11109). Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: S. Wu

Date: June 25, 1992